(12) PATENT ABRIDGMENT (11) Document No. AU-B-55040/86
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 587433

(54) Title
METHOD OF LAMINATING GLASS WITH SETTABLE RESIN

(51)⁴ International Patent Classification(s)
B32B 031/20 B32B 031/02 B32B 031/06 B32B 017/10
B29C 043/00 B29C 065/42 C03C 027/12

(21) Application No. : 55040/86 (22) Application Date : 24.03.86

(30) Priority Data

(31) Number	(32) Date	(33) Country
85/2611	09.04.85	ZA SOUTH AFRICA
85/9348	06.12.85	ZA SOUTH AFRICA

(43) Publication Date : 16.10.86

(44) Publication Date of Accepted Application : 17.08.89

(71) Applicant(s)
LAWI AG

(72) Inventor(s)
PETER HUGH MARRIOTT

(74) Attorney or Agent
DAVIES & COLLISON, MELBOURNE

(56) Prior Art Documents
52446/86 C08L 75/04, C08J 9/32, B32B 17/10
50864/85 C03C 27/12, B32B 3/30, 17/10
47868/85 C03C 27/12, B32B 3/30, 17/10

(57) Claim

1.

A method of laminating flat sheets of substantially rigid material comprising the steps of supporting a first sheet to form a concavity in a central zone, depositing a predetermined quantiy of a settable composition in the concavity, locating a second sheet over the first sheet, sealing the edges of the sheets in a liquid impermeable and air permeable relationship prior to or after locating the second sheet, causing the first and second sheets to assume a planar position and applying sufficient pressure on the sheets for the settable composition and air to flow outwardly in the interspace between the sheets.

process to improve the adhesion and to expel the last traces of air and to confine the laminate to a predetermined thickness.

In French Patent 2 384 404 an apparatus and method of laminating glass is described in which resin is deposited on a flat lower sheet and an upper sheet is flexed outwardly and lowered onto the lower sheet to form the laminate. The resin used in this laminating process is not flowable and therefore remains as a blob on the flat lower sheet.

The important property or feature of laminated glass is that the resin must be uniformly applied otherwise zones or weakness occur and these can lead to unsatisfactory and even dangerous situations.

It is an object of the present invention to provide a method of forming a laminate which ensures an even thickness of the resin.

SUMMARY OF THE INVENTION

According to one aspect of the invention a method of laminating flat sheets of substantially rigid material comprises the steps of supporting a first sheet to form a concavity in a central zone, depositing a predetermined quantity of a settable resin composition in the concavity, locating a second sheet over the first sheet, sealing the

Preferably the method includes the step of forming a meniscus with the composition as the second sheet is applied to the composition.

According to a further aspect of the invention an apparatus for laminating flat sheets of substantially rigid material includes spaced apart supports for receiving a first sheet, means for causing the first sheet to form a concavity in a central zone, positioning means for locating a second sheet over the first sheet after a predetermined quantity of a settable resin composition has been deposited in said concavity, means to move the sheets and means to apply sufficient pressure on the sheets to cause the settable resin composition to flow outwardly in the interspace between the sheets.

Preferably the means to support the first sheet comprises a table top having raised sides onto which the sheet rests. The concavity in the first sheet is preferably formed by applying downward pressure to the sheet.

Preferably the means for positioning the second sheet over the first sheet comprises a gantry having a lifting mechanism and the means to apply pressure on the sheets comprises a press.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:
Figure 1 is a schematic side view of laminating apparatus according to the invention;

onto the glass sheet 40 and the vacuum source is switched on for the glass sheet to adhere to the frame. The gantry is then moved to the workstation 14 where the glass sheet 40 is positioned on the frame 34 with the sheet resting on the edges of the frame. The suction cap 36 is fixed to the bottom of the glass sheet 40 and the vacuum source is again turned on. Downward pressure is applied to the weight 38 and this causes the glass sheet 40 to dish in a central zone as seen in Figure 2. A measured quantity of a suitable resin 44 in liquid form is poured into the dish. A gas permeable and liquid impermeable strip of tape 46 is applied around the periphery of the glass sheet 40. Another sheet of glass 48 is located on top of the glass sheet 40 using the gantry 12. The tape 46 acts as a spacer between the sheets of glass 40,48. A weighted member 50 is placed on the sheet 48 and this causes it to dish and contact the resin 44. The convex lower face of the glass sheet 48 contacts the resin 44 and a meniscus is formed. The surface tension of the resin 44 is broken as the resin spreads in the area between the sheets 40,48.

Vacuum supply to the suction cap 36 is stopped and this causes the laminate of the sheets 40,48 to resume its flat shape as seen in Figure 5. The laminate is moved to the workstation 16 using the gantry 12.

16 and the resin allowed to set. It has been found that the laminate thus formed is free of any air bubbles in the resin between the glass sheets.

3.

A method according to claim 2 which includes the step of forming a concavity in the first sheet by applying downward pressure in a central zone of the sheet until a dish is formed.

4.

A method according to any one of claims 1 to 3 including the step of locating a liquid impermeable and gas permeable tape on either the first or the second sheets, locating the second sheet over the first sheet and applying pressure in a central zone of the second sheet to cause the second sheet to contact the settable resin composition.

5.

A method of forming a laminate comprising the steps of laying a first sheet to span spaced apart raised formations to constitute a dished formation, placing a settable resin composition in the dish, curving a second sheet and applying it to the settable resin ~~resinous~~ composition with its convex face for the surface tension of the settable resin composition to move the composition outwardly.

10.

Apparatus according to any one of claims 7 to 9 in which the means for positioning the second sheet over the first sheet comprises a gantry having a lifting mechanism.

11.

Apparatus according to any one of claims 7 to 10 in which the means to apply pressure on the sheets comprises a press having air bags which are inflatable.

12.

A laminate produced according to a method of any one of claims 1 to 6.

13.

A method of laminating flat sheets substantially as herein described with reference to any one of Figures 1 to 7 of the accompanying drawings.

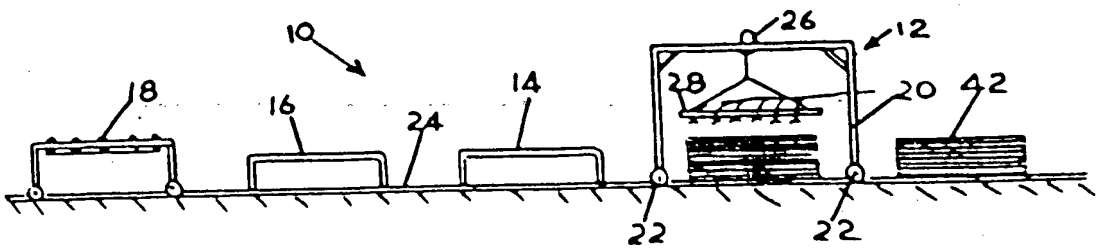
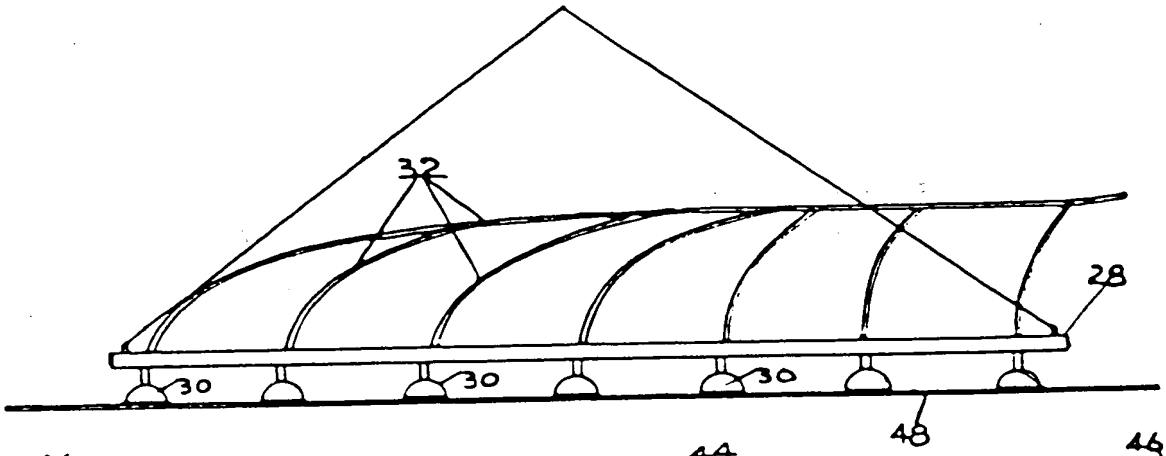


Fig 1



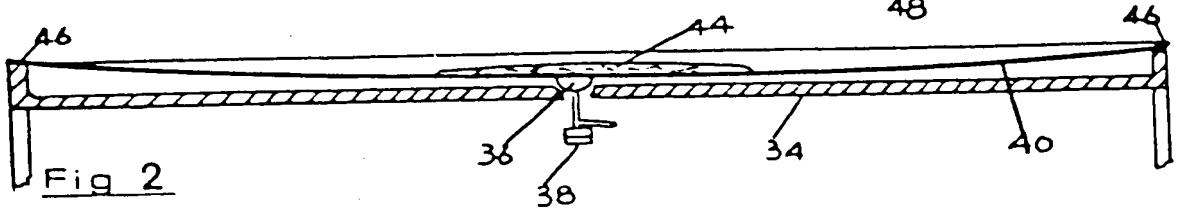


Fig 2

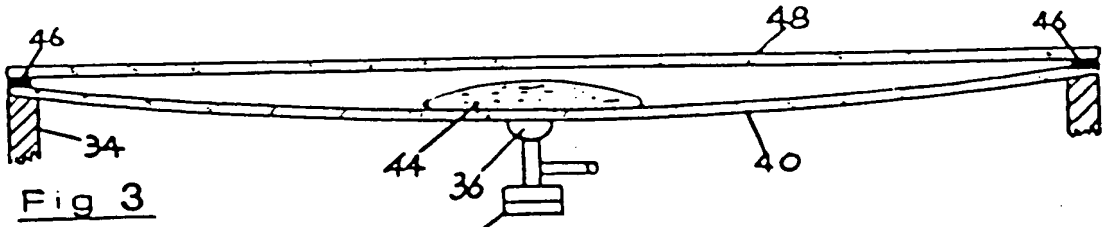


Fig 3

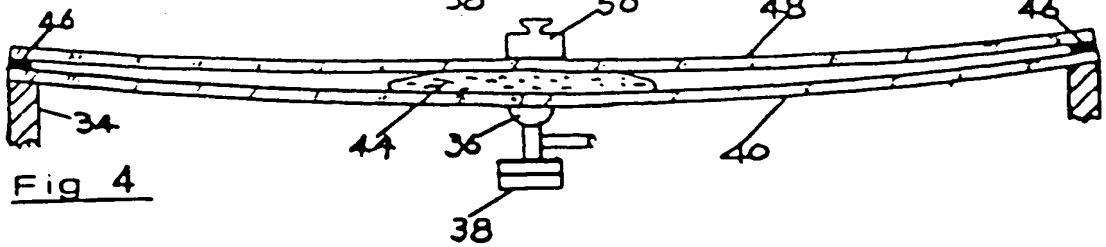


Fig 4

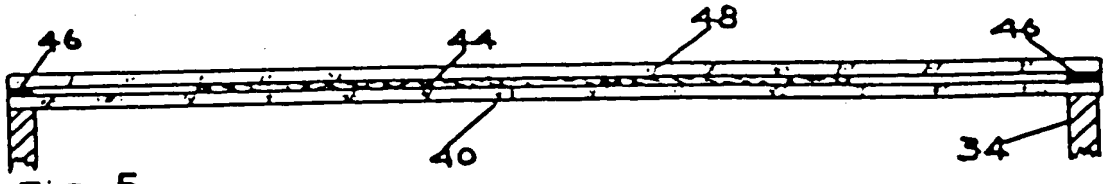


Fig 5